BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C.

In the Matter of	)	
	)	
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band, Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95
	)	
	)	RM-8811

REPLY COMMENTS OF GE AMERICAN COMMUNICATIONS, INC.

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SUMMARY

The comments in this proceeding demonstrate that the Commission must re-evaluate its spectrum plan after the conclusion of WRC-97 in order to accommodate the growing demand for satellite services. There is broad agreement that consistency with international allocations is critical to the success of any band plan for the 36-51 GHz spectrum. However, the prospects for international changes this year that correspond with the Commission's current draft are remote. The Commission must accordingly defer further action in this proceeding until the outcome of WRC-97. This brief delay will also permit the Commission to conduct a processing round for satellite services in these bands and to further explore potential spectrum sharing mechanisms. The result will be better information on which to base frequency allocation decisions.

In reviewing its proposed plan, the Commission must increase the allocation of usable spectrum for satellite services. The comments demonstrate that the limited designation of spectrum for satellite uses is clearly inadequate to meet the burgeoning demand for satellite communications. The Commission must recognize that because of the lead times involved in developing satellite technology for new spectrum bands, satellite services require dependable, long-term frequency allocations. The record also demonstrates that the Commission's proposal for "underlay" licenses in spectrum to be allocated for satellite services could adversely affect satellites' use of that spectrum and should not be pursued at this time.

Finally, the comments show that the Commission should reject the alternative band plan put forth by TIA. That plan conflicts with existing international allocations and would increase attenuation losses suffered by satellite services.

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TO: The Commission

REPLY COMMENTS OF GE AMERICAN COMMUNICATIONS, INC.

GE American Communications, Inc. ("GE Americom") hereby submits its reply to the comments of other parties in response to the *Notice of Proposed Rulemaking* in the above-captioned matter, FCC 95-85 (released March 24, 1997) ("*Notice*").

INTRODUCTION

In our initial comments, GE Americom demonstrated that the band plan proposed by the Commission in the *Notice* does not meet the requirements of the satellite industry for spectrum in the bands between 36 GHz and 51.4 GHz. These frequencies represent a source of critical expansion capacity for satellite

providers, which are facing increasing congestion in the C-, Ku- and even Ka-bands. Furthermore, we showed that the band plan is inconsistent with existing international allocations and would place on satellite operators the risk that conforming changes necessary for global satellite services do not occur. We accordingly urged the Commission to defer further action in this proceeding at least until the results of WRC-97 are known.

Other parties' comments echo GE Americom's concerns. For example, the record here strongly supports postponing further action in this proceeding. In particular, there is broad agreement that the outcome of WRC-97 will be critical to the Commission's spectrum assignment decisions. Deferring further action pending completion of WRC-97 will also permit the Commission to take into account the results of the planned processing round for satellite services in the 36-51 GHz band in assessing the spectrum requirements of the satellite industry. Finally, delaying allocation decisions will permit further study of the possibility of sharing both between government and non-government operations and among non-government services.

Similarly, numerous commenting parties emphasize the need for revision of the Commission's band plan to provide additional usable spectrum for satellite operations. Given ever-increasing demand for broadband satellite applications, it is essential that the Commission act now to preserve expansion spectrum for the present and future requirements of satellite services users. Satellite interests agree that the Commission's proposal does not provide sufficient spectrum for the multiple satellite services that must be accommodated in the 36-51

GHz bands. There is also consensus that the Commission must not go forward with its undefined concept of "underlay" spectrum at this time. That proposal only creates uncertainty about potential constraints on the usability of the limited spectrum allocated to satellite services under the Commission's plan.

Finally, the comments demonstrate that the alternative proposal advanced by the Telecommunications Industry Association ("TIA") must be rejected. TIA's plan would simply exacerbate the defects in the Commission's proposal, providing satellite services with insufficient spectrum and virtually guaranteeing that domestic satellite allocations would not align with global designations, at least in the near term.

Satellites offer unique capabilities that enhance universal access to an exploding array of services. Once WRC-97 is completed and further information about satellite spectrum needs and prospects for spectrum sharing is known, the Commission should revise its plan to accommodate the requirements of satellite services.

I. THE RECORD SUPPORTS DELAYING FURTHER ACTION IN THIS PROCEEDING PENDING INTERNATIONAL AND DOMESTIC DEVELOPMENTS.

A. The Results of WRC-97 Are Fundamental to Any Viable Plan for the 36-51 GHz Bands.

There is broad agreement among the commenters that going forward with the adoption of a band plan would be premature at this time. Most importantly, a brief delay would permit the Commission to take into account the

outcome of WRC-97 in considering its next steps. This issue is particularly critical for inherently global satellite services.

The comments uniformly affirm that the telecommunications industry as a whole benefits from consistent domestic and international allocations of spectrum. *See, e.g.*, TIA Comments at 19-21. What the comments also underscore, however, is that, for the satellite industry, consistent domestic and international allocations are not merely desirable, as they may be for other services, but are absolutely essential. Not only do satellite services incur substantial cost savings from uniform allocations, *see* Hughes Communications, Inc. ("Hughes") Comments at 13, but uniform allocations are fundamental to any system that "seek[s] to provide universal global coverage using space-based facilities that cross international boundaries." TRW, Inc. ("TRW") Comments at 14. As TRW notes, "entire categories of satellite services would be completely foreclosed if worldwide frequency allocations were not available." *Id.*

Yet, as a number of commenters recognize, all currently proposed band plans in this proceeding demand that the United States abandon several existing domestic allocations that align with current international allocations in favor of spectrum designations that expressly conflict with the existing international plan. Such proposals put the future of the American satellite industry at risk.

The current Commission draft would force FSS out of available spectrum in the high 30 GHz range and into a segment of spectrum that is not only higher in frequency (and thus subject to more severe attenuation) but that is

currently exclusively allocated for broadcast satellites internationally. As Hughes notes, the Commission's band plan "cannot be implemented in whole or in part until the results of WRC-97 are known, because the band plan is contingent on the availability of the 40.5-41.5 GHz band to accommodate FSS services, and no such allocation exists today." Hughes Comments at 17. Instead, that band is currently allocated for BSS.

Currently, no change in global allocations for satellites is even on the agenda for WRC-97. *See* GE Americom Comments at 11. The likelihood that the international community would not only consider such a change, but agree to placing FSS and BSS in the same 2 GHz range of spectrum must be considered remote.[1] The Commission cannot allow future developments in domestic satellite services to be held hostage, perhaps indefinitely, while it pursues the significant changes in international allocations required by the Commission's spectrum plan.

Because satellites depend on consistent global allocations far more than fixed systems, a premature United States allocation plan for the 36-51 GHz band risks far more than a temporary delay in enhanced domestic satellite services. Any grant of spectrum to fixed services, which may be hastily deployed, is almost

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[1] Hughes states that "there is no reason to believe that an FSS allocation change can be effectuated at WRC-97." Hughes Comments at 17. Furthermore, even if proposals seeking changes in the BSS allocation at 40.5-41.5 GHz are "considered at WRC-97, they are by no means assured of passage on a global basis." *Id.*

See also Motorola Comments at 14 ("The Commission's proposals in this proceeding would require changes in the current International Table of Allocations, but the Commission cannot be assured that such changes will be adopted at the upcoming Conference.").

certainly irrevocable. Even if the Commission should realize in a few years that it gave too much too soon to fixed services, it is unlikely to be able to persuade the entire global community to agree to specific segments of spectrum to restore to satellite services. Such a result would, as TRW has noted, preclude important satellite services from ever using the 36-51 GHz band. *See* TRW Comments at 14.

Adopting any proposal for this band prior to WRC-97 thus places the future of domestic satellite services at considerable risk. The Commission should not adopt any domestic plan until it can be sure that domestic satellite allocations have the opportunity to be used globally. The Commission should not act in this or any other proceeding affecting the 36-51 GHz band until WRC-97 has been completed. *See* Hughes Comments at 18; Lockheed Martin Comments at 14; Motorola Comments at 12-13; TRW Comments at 5.

B. The Commission Will Be Better Able to Assess Satellite Spectrum Requirements in the 36-51 GHz Bands After it Holds a Satellite Processing Round.

Deferring action in this proceeding will also permit the Commission to proceed with its planned satellite processing round prior to making final spectrum decisions in these bands.

The Commission must recognize that satellites differ substantially from terrestrial applications in the lead time necessary to develop new applications. As TRW points out:

> Unlike terrestrial systems, which can be based on "off-the-shelf" technology, satellite systems require long-term planning and development due to their very high initial capital costs and lengthy

> construction timeframes. It takes a long time and the expenditure of large sums of money (much of which is non-recoverable) to determine the technical feasibility and commercial viability of particular spectrum for satellite services. Satellite hardware must be specially developed for each frequency band before actual use of the spectrum can begin.

TRW Comments at 12. Hughes agrees, noting that because satellite equipment "simply cannot be recovered and repaired once it is deployed, [it] must be significantly more technically mature and reliable before it can be incorporated into new commercial systems." Hughes Comments at 9. *See also* Lockheed Martin Comments at 10.

Despite these timing issues, GE Americom and other satellite commenters expect a strong response to the Commission's planned processing round for satellite services in these bands. *See, e.g.*, Hughes Comments at 9 n.6 (the current lack of multiple satellite applications in these bands "reflects the absence of a filing window, not the absence of satellite-industry interest"). At a minimum, the processing round will provide the Commission with a preliminary indication of the breadth and number of satellite applications for the 36-51 GHz band that are currently being contemplated. GE Americom strongly agrees with other commenters that it is inappropriate for the Commission to move forward with defining spectrum allocations for satellite services in these bands until it has opened a filing window for applications in those services. *See, e.g.*, Lockheed Martin Comments at 11; Motorola Comments at 6; TRW Comments at 14-15.

Once the filing window closes, the Commission will be better informed regarding the satellite service applications that are being developed for the 36-51 GHz bands. As a result, it will be in a much better position to weigh competing demands on the spectrum in these bands.

C. Further Exploration of Sharing Issues Is Required.

Finally, postponing further action in this proceeding will permit the Commission to gather additional information about the potential for sharing among services in these bands. As GE Americom has emphasized, developing realistic sharing mechanisms is critical to efficient utilization of 36-51 GHz spectrum. GE Americom Comments at 8.

The Commission must examine the ability of various services to share spectrum, and take that information into account in making spectrum designations. For their part, fixed services interests repeatedly declare their inability to share spectrum with satellite services. *See, e.g.*, TIA Comments at 14 (dismissing any band sharing as "impractical"); WinStar Comments at 3-5. In contrast, a number of satellite industry parties support exploration of sharing techniques. *See, e.g.*, Lockheed Martin Comments at 13 ("[a]ll realistic sharing possibilities should be explored"); Motorola Comments at 18; TRW Comments at 15-16. Because efficient use of spectrum is dependent on the ability to share spectrum with other services, the Commission should not allocate large amounts of spectrum to services unwilling or unable to coordinate uses of available spectrum with more flexible services.

In a similar vein, the Commission should further investigate the potential for sharing between government and commercial satellite services before making any final determinations regarding spectrum designations. Hughes notes that the Commission's current plan places risks associated with future government spectrum requirements on the satellite industry. *See* Hughes Comments at 15-16. As a result, the plan creates additional uncertainty that is harmful to the industry's ability to develop applications in the 36-51 GHz bands. The Commission must provide additional information regarding existing and proposed government uses of these bands so that the Commission and the commercial satellite industry can better assess the impact of such government spectrum requirements on non-government users.[2]

II. THE COMMISSION'S BAND PLAN MUST BE REVISED TO MEET SATELLITE INDUSTRY REQUIREMENTS FOR USABLE SPECTRUM IN THE 36-51 GHz BANDS.

Once WRC-97 is completed, the satellite processing round window has closed, and further sharing analysis has been performed, the Commission can begin revising its spectrum plan to accommodate the requirements of the satellite industry. In particular, the plan must be revised to designate additional spectrum for satellite services, and the undefined proposal for "underlay" spectrum should be abandoned.

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[2] *See also* Motorola Comments at 10 ("The Commission should encourage Government users (through NTIA) to cooperate in making the most efficient use of the millimeter wave and other FSS bands.") (footnote omitted); TRW Comments at 16.

A. The Record Demonstrates that the Commission's Plan Would Allow Insufficient Spectrum for Satellite Services.

GE Americom demonstrated in its comments that the bands at issue here are critical to the satellite industry. GE Americom Comments at 3. Hughes agrees, noting that the 36-51 GHz bands represent "the only practicable frequency bands available for the next generation of satellite services." Hughes Comments at 9. Fixed services interests acknowledge that they can make use of frequencies above 51 GHz, and intend to do so in the near future. *See* TIA Comments at 7-8. In contrast, atmospheric attenuation makes transmissions to and from satellites in the range immediately above 51 GHz technologically unfeasible. Accordingly, the spectrum that satellites maintain in the 36-51 GHz bands must satisfy the needs of all satellite services for many years to come.

The Commission's current plan simply does not address these needs. As Hughes points out, the demand for satellite services:

> is rapidly increasing as our communications infrastructure strains under the explosive growth of the demand for the transportation of voice, video, and data, especially high-bandwidth, high-speed transportation. The existing satellite systems presently operating or planned for deployment using the C, Ku, and Ka band allocations will not be sufficient to satisfy this rapidly expanding demand.

Hughes Comments at 2. Lockheed Martin agrees that the Commission's band plan "is, from a purely quantitative standpoint, weighed heavily in favor of terrestrial interests at the expense of the U.S. satellite industry." Lockheed Martin Comments at 8. Motorola points out that the limited amount of FSS spectrum provided for

under the Commission's plan "would severely impair the viability of broadband satellite systems worldwide." Motorola Comments at 5.

The Commission must respond to these concerns by reassessing its proposal in order to allocate additional spectrum to satellite services. In particular, the Commission must act to preserve current global allocations for satellite services. *See* Lockheed Martin Comments at 8-9. As already noted, it is far easier to add terrestrial services to spectrum allocated for satellite use through secondary designations than the converse. Commission action to protect satellite allocations now and for the future is necessary to reassure investors in satellite systems and encourage efficient use of spectrum by other services. GE Americom accordingly urges the Commission to designate 4 GHz of contiguous bandwidth each for uplink and downlink frequencies for satellite services.

B. The Record Supports Abandonment of the Underlay Concept.

A number of commenters agree that the underlay concept proposed by the Commission is premature and inappropriate. As Motorola points out, "ITU regulations do not contemplate the concept of underlay licenses." Motorola Comments at 20. Thus, adoption of underlay policies in the U.S. could lead to interference problems for satellite operators around the world. *Id.*

Even domestically, however, the practical problems presented by the underlay approach are substantial. At best, awarding underlay licenses to fixed services in spectrum designated for satellites would be useless in light of the statements by fixed services interests that they cannot share spectrum. Perhaps for

this reason, even TIA sees no real need for underlay licensing at this time. *See* TIA Comments at 17 (noting that the "'underlay' concept would serve no purpose for existing FS") (emphasis deleted).

At worst, allowing underlay uses of spectrum might well threaten the utility of the scarce bandwidth to be allocated to satellites. *See* Motorola Comments at 15. The Commission has not made clear what rights an underlay licensee would have with respect to operations by a carrier in the predominant service. However, the comments clearly demonstrate that the risk that underlay uses would impair the rights of the primary service licensee outweighs any perceived benefit of this proposal.

III. TIA'S PROPOSED ALTERNATIVE SPECTRUM PLAN SHOULD BE REJECTED.

Finally, the Commission should summarily reject the alternative proposal for spectrum designations put forth by TIA. *See* TIA Comments at Appendix A. TIA's proposal would move all of satellites' downlink frequencies above 40 GHz, increasing harmful attenuation effects on transmissions. *See* Motorola Comments at 9 (FSS spectrum should be at the lowest end of the available frequency range "due to the rapidly increasing atmospheric attenuation problems at higher frequencies").

TIA's plan would also require satellites to accept downlink frequencies entirely at odds with existing international allocations. This suggestion is flatly contradicted by TIA's own wise advice that the Commission should take no action that "could make the [United States] the sole dissident to otherwise global

standards." *See* TIA Comments at 20.[3] The Commission should take TIA at its word, and tailor its actions in this proceeding to be consistent with international spectrum allocations.

CONCLUSION

GE Americom urges the Commission to act cautiously here and to protect the interests of the satellite industry in meeting the ever-increasing demands for satellite services. Specifically, the Commission should postpone adoption of a spectrum plan until after WRC-97 is concluded and the Commission is better able to assess satellite spectrum requirements and potential sharing

[3] Other proposals are even more extreme. The International Communications Electronics Group ("ICE-G"), for example, would seize the only 2 GHz left under TIA's plan for satellite services' downlinks, and reallocate it entirely for fixed and wireless mobile services. ICE-G Comments at 4. Obviously, such a drastic cutback on satellite services' spectrum in these bands cannot be justified.

methods. The Commission should then revise its proposal to allocate additional bandwidth for satellite services. TIA's alternative band plan should be summarily rejected.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing Reply Comments of GE American Communications, Inc. were served by hand delivery this 3rd day of June, 1997 to:

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